

Application No. 10/029,350
Docket No. 13DV-14197
Amendment dated January 8, 2004
Reply to Office Action of November 8, 2003

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claim 1 (currently amended): A process for rejuvenating a diffusion aluminide coating on a component following deposition of the diffusion aluminide coating and before placing the component in service at an elevated temperature, the diffusion aluminide coating comprising an additive layer on a surface of the component and a diffusion zone below the additive layer and in a surface region of the component, the process comprising the steps of:

treating the diffusion aluminide coating to an aqueous solution consisting ~~essentially~~ of about 50 volume percent nitric acid and about 50 volume percent phosphoric acid at a temperature of about 70°C to about 80°C until at least part of the additive layer has been removed but the diffusion zone remains, thereby establishing a treated surface of the diffusion aluminide coating; and then
aluminizing the treated surface of the component.

Claim 2 (currently amended): A process according to claim 1, wherein the

Application No. 10/029,350
Docket No. 13DV-14197
Amendment dated January 8, 2004
Reply to Office Action of November 8, 2003

aqueous solution consists of HNO₃, H₃PO₄, ~~nitric acid~~, ~~phosphoric acid~~ and water.

Claim 3 (canceled)

Claim 4 (original): A process according to claim 1, wherein the diffusion aluminide coating is treated for a duration of about 20 to about 30 minutes.

Claim 5 (original): A process according to claim 1, wherein the aqueous solution is at a temperature of about 75°C and the diffusion aluminide coating is treated for a duration of about 25 minutes.

Claim 6 (original): A process according to claim 1, further comprising the steps of depositing a platinum layer on the treated surface following the treating step, and then heat treating the component to diffuse the platinum layer into the treated surface before the aluminizing step.

Claim 7 (original): A process according to claim 1, wherein the diffusion aluminide coating contains platinum, the process further comprising the steps of depositing a platinum layer on the treated surface following the treating step, and then heat treating the component to diffuse the platinum layer into the treated surface before

Application No. 10/029,350
Docket No. 13DV-14197
Amendment dated January 8, 2004
Reply to Office Action of November 8, 2003

the aluminizing step.

Claim 8 (original): A process according to claim 1, wherein the diffusion aluminide coating is present on the component as a result of aluminizing the component after the component has been placed in service at an elevated temperature.

Claim 9 (original): A process according to claim 8, wherein the diffusion aluminide coating is present on the component at a thickness in excess of 100 micrometers prior to the treating step.

Claim 10 (original): A process according to claim 1, wherein the component is a gas turbine engine component, and the diffusion aluminide coating is present on the component as a result of aluminizing the component after the component was installed on a gas turbine engine, the gas turbine engine was operated, and the component was removed from the gas turbine engine.

Claim 11 (original): A process according to claim 10, wherein the diffusion aluminide coating is present on the component at a thickness in excess of 100 micrometers after the aluminizing step and prior to the treating step.

Application No. 10/029,350
Docket No. 13DV-14197
Amendment dated January 8, 2004
Reply to Office Action of November 8, 2003

Claim 12 (original): A process according to claim 1, wherein the treating step removes substantially all of the additive layer and does not damage the surface region of the component.

Claim 13 (currently amended): A process for rejuvenating a diffusion aluminide coating on a gas turbine engine component formed of a nickel or cobalt-base superalloy, the diffusion aluminide coating comprising an additive layer on a surface of the component and a diffusion zone below the additive layer and in a surface region of the component, the process comprising the steps of:

removing the component from a gas turbine engine after the gas turbine engine was operated;

aluminizing the component to form a rejuvenated diffusion aluminide coating having an additive layer with a thickness in excess of 100 micrometers;

before placing the component in service on a gas turbine engine, treating the diffusion aluminide coating to an aqueous solution consisting ~~essentially~~ of about 50 volume percent nitric acid and about 50 volume percent phosphoric acid at a temperature of about 70°C to about 80°C for a duration of about 20 to about 30 minutes to remove at least part of the additive layer but the diffusion zone remains, thereby establishing a treated surface of the diffusion aluminide coating on the component; and then

Application No. 10/029,350
Docket No. 13DV-14197
Amendment dated January 8, 2004
Reply to Office Action of November 8, 2003

aluminizing the treated surface of the component to form a second rejuvenated diffusion aluminide coating having an additive layer with a thickness of not greater than 100 micrometers.

Claim 14 (currently amended): A process according to claim 13, wherein the aqueous solution consists of HNO₃, H₃PO₄, ~~nitric acid, phosphoric acid~~ and water.

Claim 15 (canceled)

Claim 16 (original): A process according to claim 13, wherein the aqueous solution is at a temperature of about 75°C and the diffusion aluminide coating is treated for a duration of about 25 minutes.

Claim 17 (original): A process according to claim 13, further comprising the steps of depositing a platinum layer on the treated surface following the treating step, and then heat treating the component to diffuse the platinum layer into the treated surface before the aluminizing step.

Claim 18 (original): A process according to claim 13, wherein the diffusion aluminide coating contains platinum, the process further comprising the steps of

Application No. 10/029,350
Docket No. 13DV-14197
Amendment dated January 8, 2004
Reply to Office Action of November 8, 2003

depositing a platinum layer on the treated surface following the treating step, and then heat treating the component to diffuse the platinum layer into the treated surface before the aluminizing step.

Claim 19 (original): A process according to claim 13, wherein the treating step removes substantially all of the additive layer and does not damage the surface region of the component.

Claim 20 (original): A process according to claim 13, wherein the step of aluminizing the treated surface is a vapor phase aluminiding process.